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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/712,506

11/13/2003

Hans-Georg Herrmann

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DAVIDSON, DAVIDSON & KAPPEL, LLC
485 SEVENTH AVENUE, 14TH FLOOR
NEW YORK, NY 10018

EXAMINER

LAMBELET, LAWRENCE EMILE

ART UNIT

PAPER NUMBER

1732

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

03/08/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/712,506

Applicant(s)

HERRMANN ET AL.

Examiner

Lawrence Lambelet

Art Unit

1732

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 October 2006.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
4a) Of the above claim(s) 11-16 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-10 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of Group I, claims 1-10, in the reply filed on 10/2/2006, is acknowledged.

Claims 11-16 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gilbert et al (U.S. Patent 5,679,299).

Gilbert et al, hereinafter "Gilbert", discloses a method of manufacturing a composite material reading on claim 1. Gilbert teaches that amorphous thermoplastic fibers which have been melt-extruded and simultaneously drawn exhibit an orientation characterized by an increase in the heat relaxation ratio. See lines 10-20 in column 3. Gilbert further teaches that when these fibers are laid-up in a preform, such as a mat, wherein adjacent fibers are in contact, and heat is applied with fiber constraint (stress) to a temperature above the glass transition point and below the degradation

temperature, a fusion occurs at the outer surfaces of the fibers. Inherent therein is a first melt point. See lines 20-41 in column 3. The constraint would necessarily be applied in the orientation direction, otherwise the fibers would lose contact prior to fusion.

Gilbert effectively teaches that there are two blended phases present in the fiber. Gilbert mentions that the longitudinal orientation of the molecules is not substantially reduced in this procedure. See lines 35-40 in column 3. This means that there necessarily is a second melt point beyond the heating range, otherwise the molecular organization would have been lost during heating. The first melt point gives evidence of a second phase present in the fiber, that of the original amorphous, or non-oriented, morphology.

Gilbert teaches that the oriented and non-oriented phases are the same composition (PMMA), as required by claim 2. See lines 40-45 in column 3. Gilbert further teaches that fibers and narrow bands are formed, as required by claim 4. See lines 10-20 and 30-35 in column 3. It would have been obvious to one of ordinary skill to consider the blend constituents of amorphous and oriented PMMA as two different materials, much the same as PE and UHMWPE are considered different materials, even though they are both polyethylene.

Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gilbert as applied to claims 1-2 and 4 above, and further in view of Bjekovic et al (U.S. Patent Application Publication 2002/0016121).

Gilbert teaches the method of 1-2 and 4, as discussed above.

Gilbert does not teach a plurality of parallel fibers interwoven in warp and weft bands, as required by claim 6, or that the warp and weft directions are from 45° to 135°, as required by claim 7. Gilbert further does not teach oriented and non-oriented in layers, as required by claim 5.

Bjekovic et al, hereinafter "Bjekovic", teaches warp and weft bands of parallel fibers running at 90°. See Fig. 1. Bjekovic further teaches a composite produced by heating where at least two layers of fabric (oriented) are separated by a layer of plastic in powder form (non-oriented). See the abstract.

Gilbert and Bjekovic are combinable because they are concerned with a similar technical field, namely, fibers in oriented configurations. One of ordinary skill in the art at the time of the invention would have found it obvious to include the fabric sandwich configuration of Bjekovic in the composite manufacturing method of Gilbert. The motivation to do so would have been to improve the cross-directional strength of the composite with a bi-directional fiber lay-up. See lines 10-25 in column 2 of Gilbert.

Claims 3 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gilbert as applied to claims 1-2 and 4 above, and further in view of Lipscomb et al (U.S. Patent 4,147,749).

Gilbert teaches the method of 1-2 and 4, as discussed above.

Gilbert does not teach that the composite material includes polyolefins, as required by claim 8, or that the oriented and non-oriented are made of the same mixtures of materials, as required by claim 3.

Lipscomb et al, hereinafter "Lipscomb", teaches a material for use in a high oriented and low oriented fabric configuration can be polyolefins. See lines 28-32 in column 1. It is known in the art that polyolefin can comprise a mixture of polyethylene and polypropylene.

Gilbert and Lipscomb are combinable because they are concerned with a similar technical field, namely, fiber blends exhibiting different degrees of orientation. One of ordinary skill in the art at the time of the invention would have found it obvious to include the polyolefin ingredient of Lipscomb in the composite manufacturing method of Gilbert. The motivation to do so would have been to enhance susceptibility to the action of heat. See lines 13-16 in column 1 of Lipscomb.

Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gilbert as applied to claims 1-2 and 4 above, and further in view of Kay et al (U.S. Patent 6,482,497).

Gilbert discloses a method of manufacturing a composite material reading on claims 9 and 10. Gilbert teaches that amorphous thermoplastic fibers which have been melt-extruded and simultaneous drawn exhibit an orientation characterized by an increase in the heat relaxation ratio. See lines 10-20 in column 3. Gilbert further teaches that when these fibers are laid-up in a preform, such as a mat, wherein

adjacent fibers are in contact, and heat is applied with fiber constraint (stress) to a temperature above the glass transition point and below the degradation temperature, a fusion occurs at the outer surfaces of the fibers. Inherent therein is a first melt point. See lines 20-41 in column 3. The constraint would necessarily be applied in the orientation direction, otherwise the fibers would lose contact prior to fusion.

Gilbert effectively teaches that there are two blended phases present in the fiber. Gilbert mentions that the longitudinal orientation of the molecules is not substantially reduced in this procedure. See lines 35-40 in column 3. This means that there necessarily is a second melt point beyond the heating range, otherwise the molecular organization would have been lost during heating. The first melt point gives evidence of a second phase present in the fiber, that of the original amorphous, or non-oriented, morphology.

Gilbert does not teach holding the material under pressure in a 3D mold, as required by claim 9.

Kay et al, hereinafter "Kay", teaches holding an oriented/non-oriented preform in a mold and drawing a vacuum therein. See lines 20-30 in column 1 and Fig. 15.

Gilbert and Kay are combinable because they are concerned with a similar technical field, namely, fiber composites exhibiting different degrees of orientation. One of ordinary skill in the art at the time of the invention would have found it obvious to include the mold apparatus of Kay in the composite manufacturing method of Gilbert. The motivation to do so would have been to seek both method and means of applying pressure and constraint. See lines 34-38 of column 3 of Gilbert.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following document is cited to further show the state of the art with regard to oriented/non-oriented composites:

U.S. Patent 3,481,804 to Snyder

U.S. Patent 4,355,076 to Gash

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lawrence Lambelet whose telephone number is 571-272-1713. The examiner can normally be reached on 8 am-4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on 571-272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LEL
3/1/2007


CHRISTINA JOHNSON
SUPERVISORY PATENT EXAMINER
3/5/07